Briteland

Biobin

Vermiculture Composting System

BULK

Owner's Manual

Introduction

As the population of urban and rural communities continues to increase, the disposal of garbage becomes an increasing concern. Landfill sites have limited tenure, with suitable replacement sites not readily available. Therefore, as responsible citizens we should all practice the 5R's; Rethink, Reduce, Reuse, Recycle, & Residual Management. We'll try to explain these concepts using a new overcoat as an example.

1) Rethink – Do I really need that new coat?
2) Reduce - If I need the coat, do I need to buy one every year or one every few years? Do I need the packaging it came in?
3) Reuse – Can someone else use the coat when I'm done with it?
4) Recycle – Can I make the coat or its parts into some other useful item?
5) Residual Management – When it can no longer be used, and must be disposed of, can the final impact of disposal be lessened through separation and compaction of component parts? (zipper, buttons, fabrics…)

A component of garbage, organic wastes are often put into the regular garbage to be forwarded to the landfill. These wastes include but are not exclusive to coffee grounds & filters, fruit and vegetable peels and cores, paper, melon rinds, & tea bags.

After several years of experimenting and testing, the technicians at Briteland Agricultural Services & Supplies Ltd. have developed a composting system, that:

- is practical, to handle a daily waste volume of around 20 liters of compost that is generated by a staff lunch room , restaurant, or several homes;
- is fun, educational and **easy** to use, so it **does** get used;
- is virtually odor free, as the special composting worms consume the wastes so quickly that degradation odors don't have time to develop;
- takes up a small 48" X 34" footprint, so it fits indoors in a basement, garage/carport, or in an accessible area outdoors. Also suitable for indoor composting from urban offices, apartments, condos, to rural homes where bears or other wild animals are a problem
- is appealing to look at, continually cycles, durable and simple in design
- provides worms for fish bait, plus both tea and castings for soil conditioning and plant care.

Record Keeping

Keep a record of the date, amount of green (vegetable waste etc.) and black (carbon materials, paper, grass cuttings etc.) put in, and compost and tea harvested. You'll really be surprised at the volumes both consumed and produced. You should expect about a 40 to 1 conversion ratio (eg: 40 bins of waste = 1 bin of compost)

Date	*Description*	*# Carbons*	*# Greens*	*# Harvest Castings*	*Liters Tea*

Troubleshooting

Odours

If an offensive odour is noted, it indicates that too much organic waste has been added to the Biobin, and it is starting to decompose before the worms can get to it. One of the main reasons would be the placement of wastes on top of the bedding, rather than burying it into the bedding. A top dressing of shredded paper or potting soil , 5cm (2") thick gives a good mat to bury waste under. **Ensure that the wastes are buried.** If odours still occur, stop the feeding and mix a bit of garden lime and/or crushed eggshells into the bedding. Stirring the wastes up with a trowel helps aerate the compost, and allows easier worm movement through it. Do not add any more waste until the odour has disappeared. Odours also can be caused from an overabundance of smelly foods like garlic, onions and cabbage. Follow the procedure above.

If the tea has a sulphur smell, it is likely too acidic. Add lime and remove the sealing ring on the tea bin to allow more air in. Test both the bottom bin bedding and tea with pH strips. A ph of 7 or neutral is desired.

Temperature

Try to maintain a temperature in the 15 – 25 C (60-80F) range.

Vibrations

Worms are quite sensitive to vibrations, and if placed by vibrating equipment they won't be happy.

Citrus Peels

The citric acid in the peels is hard on the worms. When you put these in, add some garden lime to neutralize the pH of the acid in the peels.

Little White Worms!

These are entrachyadids, which indicate acidic conditions. Sometimes an influx of maggots may develop. These are likely soldier fly or vinegar fly larvae. Although these are actually beneficial to waste breakdown, liberally apply lime to sweeten to compost, and reduce the potential fly population.

Fungous Gnats & Fruit Flies

These are little flies that live in the upper bedding layer or on the surface. Add more bedding to cover the compost. Mix Diatomaceous Earth Organic bug killer with bedding. This will control the flies & not harm the worms.

Worms on the inside of the lid

The worms are reacting to changes in air pressure as they sense a rainstorm coming. Just leave the lid off for a while and they will settle back down into the bedding.

Heating of the Compost

This can occur from the heat of decomposition. Too much organic matter has been added too quickly. Remove the offending mass and stop feeding for a while. You might cool things down by adding a water drench. Remember to harvest the tea, as it accumulates in the lower bin.

What is the Briteland Biobin Bulk?

The Briteland Biobin Bulk is designed to be small enough to take up very little space & large enough to process significant volumes of compostable waste materials. It consists of:

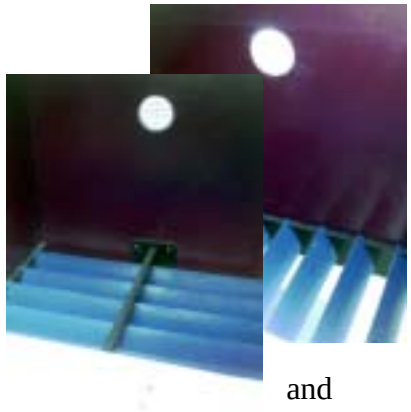
1) a durable fibreglass inner & outer wall construction with a foam insulating core;

2) a sloped fibreglass lid, to help shed water & snow. This lid has a locking access door, with an easy to open twist style handle;

3) The base section is a basin that will contain excess tea or liquids should the tea tray not be emptied in time;

4) The side corners are made of aluminium plate to provide structural integrity & corner impact resistance;

6) There are 4 air vents in the upper chamber to allow airflow, reduce excess condensation & odour accumulations;



7) Supporting the active compost (worms, bedding & media), are curved fibreglass vanes designed to support the weight of the compost and allow the castings to pass through. A central support beam completes this feature;

8) A locking lower front door which flips up to a holding clip, allowing access to both the casting and tea catchment trays.

Included is a bag of ground limestone, and this operating manual.

Getting Ready

The Biobin Bulk system comes assembled in the BC Interior or can be shipped dissembled flat on a pallet.

a) Place 6” of shredded paper over the support vanes. This prevents the bedding from falling through prematurely. Then moisten the paper down to make a mat.

b) Put in 8” of potting soil or peat moss as a bedding for the worms to live in, &and moisten it well with water.

c) Put in 4.54 – 9.08 KG’s (10 to 20 lbs) of Red Wiggler Composting Worms into the upper composting chamber.

d) Allow the worms to settle in for a couple of days before starting the feeding program, as the worms are very sensitive to starting out in their new home. Keep the bin still as the worms are quite sensitive to vibrations and bin movements at this time. The worms will be quite happy to stay and propagate in their new home, which is warm, moist, dark and has regular fillings of compost.

e) Feed the worms, and then cover with potting soil or other media. Remember, the finer the compost is chopped down to, the faster the worms can process it! **Don't** leave the compost uncovered as shown in the picture.

How do I Use the Castings?

Simply top-dress the castings over all soil surfaces, indoor or out. Where possible, the castings can be incorporated in to the top 6".

What is in the Tea?

Our analysis of the tea produced here showed the following nutrients in parts per million:

- Nitrogen	0.05
- Phosphorus	> 0.4
- Boron	0.70
- Copper	0.60
- Iron	8.40
- Magnesium	249.00
- Manganese	1.90
- Molybdenum	0.20
- Zinc	64.30
- Aluminum	2.30
- Calcium	134.00
- Sodium	321.00
- Sulfate	235.00

How do I use the Tea

Tea can be used at up to100% strength every so often without burning, but watering at 1 part tea to 25 parts water each watering, we've found is an excellent procedure.

Types of Products not to Compost

Meat scraps can be composted in small amounts, but are troublesome if you have a pet in the house, as they may go after those wonderful meat smells. Refined or concentrated products such as oils, salad dressings & dairy products are difficult for the worms to eat, so it is best not to compost them.

Pet feces and horse manures are not suitable for worm composting as the de-worming treatments for the animals carry through and will kill the worms in the bin.

Harvesting

The bin that you will harvest the castings from will be bin 2. Most of the worms will have moved into the upper bins following the smell of new food waste. Some worms may remain in bin 2, but not to worry! Worms just do not like the light. You can simply put the bin into a bright room and scoop off a 2.5cm (1") layer at a time, keeping an eye out for worms. The worms will move downwards to escape the light, and concentrate in the castings that remain.

Then put the almost empty bin 2 back onto the Biobin as the new top bin. The remaining compost with remaining worms in it becomes the bedding for carrying on the process.

What is in the Castings?

Worms have a simple digestive process, initiated and stimulated by other organisms. When worms expel their manure/castings they are encapsulated by a thin mucus membrane, which hardens when exposed to the air. When the castings are mixed with or top-dressed on garden or houseplant soils, there is a slow "time release" of nutrients, enzymes and humic acid to feed the plants, and condition the soil.

Castings are pH neutral. A typical analysis in parts per million is:

Nitrate	150
Phosphorus	69
Potassium	161
Calcium	1805
Magnesium	458
Ammonium	3.0
Boron	2.5
Molybdenum	0.1
Zinc	7.1
Copper	>0.1
Iron	5.3
Manganese	0.3

Using the Biobin Composting System

1) Start feeding the worms with up to 4 Liters of soft or green compost products per day. Then work up to 20 liters per day after 4 weeks or so, as the worm numbers start to increase. When putting the compost in the bins, ensure that it is **covered with bedding**. Moistened shredded paper works great. This reduces any fruit fly and fungus knat problems. Use a trowel to dig a hole and cover up the compost.

2) As this system uses a **continuous vertical composting** concept, you fill the upper chamber with compost and bedding, and the castings are pushed by weight into the lower chamber through the support rack. The whole idea is for the top bin to contain all the worms, whilst the bottom compost tray is left with just worm castings, and very few worms. This helps greatly with harvesting the castings. Fill the top & harvest the bottom!

3) Once enough castings have accumulated in the castings tray, (have a look for nice crumbly moist compost), simply empty the compost tray of the castings using a shovel or rake.

4) Continue the process by repeating the cycle.

5) Harvest the tea by sliding the tea bucket out and pouring it into another bucket for transport. Use the tea indoors with potted plants, or outdoors in the flower, vegetable and ornamental gardens. You can use the tea at up to 100% without burning, but we suggest mixing 1 part tea to 25 parts water with every watering.

6) We recommend setting the castings aside in a bucket or container as:
    a) it contains worm eggs that can be hatched out, given a few weeks. And

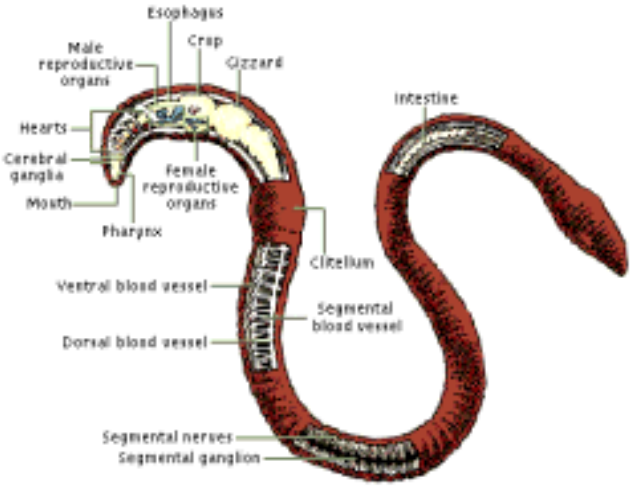
    b) some worms will be in the castings, and will migrate to dark (bottom) areas of the bucket as they are light sensitive. Put these worms back into the top chamber of the Biobin Bulk Composter.

Helpful Hints & Information

Type of Worms

Use the proper type of worms. Tigers or Red Wigglers are preferred, starting with a minimum of 1000 worms (about .5kg or 1 lb). Earthworms, such as those found in the garden, prefer a different environment and won't do well in the Biobin.

Consumption of Organic Matter



1 lb of worms eats approximately 227 grams (1/2lb) of food scraps per day. Don't expect miracles overnight. The worms must get established before they start to reproduce, and the baby worms take about three months to mature. As the worms multiply, the will turn more and more waste into castings and tea. Therefore, feed steadily by putting in a little bit each day, building up the system gradually.

Worm assistance is a tremendous advantage for a composting system. Each healthy adult composting worm will convert its own body weight of waste into the highest quality compost every day! Don't overfeed. The worms will process the waste more efficiently if it is mashed or blended, and buried or mixed into their bedding.

Their speed of work allows kitchen waste to be recycled before it can start to smell, as it would in a garbage can. Therefore, the process is essentially odorless, as the worms prevent unpleasant rotting smells. In fact the only smell from a healthy bin is a faint, earthy smell from the compost.

Should you go away for a while, the worms will continue to carry on for several weeks in your absence, and you can resume feeding when you return. Red Wigglers congregate where the food concentration is greatest and regulate their numbers to match the supply of waste. You couldn't wish for a better tool for the job.

Where to Put the Biobin

Red Wiggler worms prefer cool, damp and dark environments. Temperatures from 15-15 C (60 – 80 F) are excellent. The Briteland Biobin Bulk has been developed to take up a small footprint ***indoors*** in your garage/carport, basement area, or another area convenient enough for you to access readily. Outdoor placement will require a soil heating coil for below ideal temperatures. Worms are odorless and free from disease. They have the ability to aerate, sanitize and deodorize food wastes as they process it into castings.

Moisture

Composting worms require moisture to be effective. Generally the food wastes will keep the bedding sufficiently moist. However, if composting materials such as newspaper or cardboard are added, they should first be soaked in water before adding to the bedding. If the bedding is still too dry, some water should be poured over it.

Reproduction

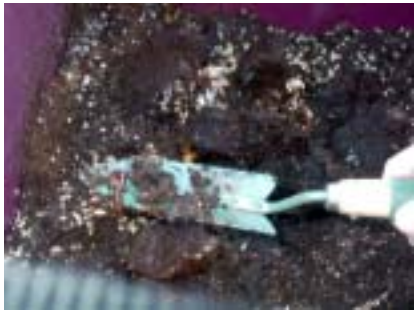
Red worms are hermaphroditic, producing an egg capsule every 14-21 days, with each capsule containing a potential of up to 20 baby worms.

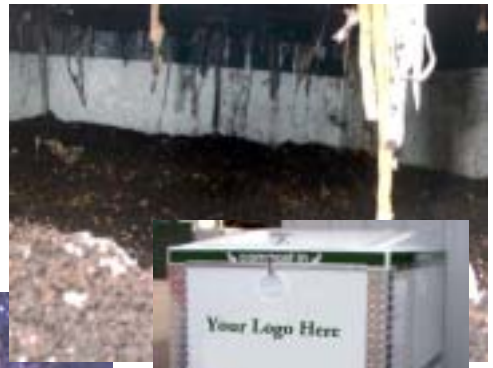
Migration & Separation

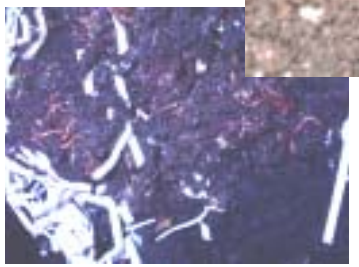
The worms will move to where the food is. As you feed kitchen waste on top of the bedding, then cover it with more bedding, the compost builds up, until the weight of the compost pushes the castings down & into the castings tray. The support vanes have air below them that keep the worms in the upper bin chamber. A light can be installed in the castings chamber (note: the white walls) to further enhance separation. Some worms may fall through with the castings, and can be separated from the castings at harvest, using their light sensitivity to accomplish this. Put the castings in a pile on a tarp, in the sun, or under a light. The worms will migrate to the center of the pile allowing you to harvest the outer edges worm free.

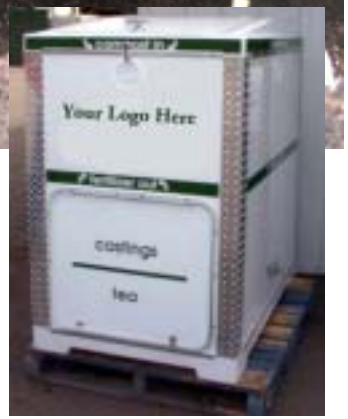
Types of Products to Compost

A rule of thumb is that if it was once living, worms will eat it. Most types of green vegetable trimmings, shredded paper, fruit cores and skins, coffee grounds and the filters, melon rinds, tea bags, vacuum cleaner dust and hair… Pre-wetted torn up newspapers, cardboard egg & pizza cartons & potting soils make good bedding. Worms don't have teeth, so large hard vegetable stalks and potatoes take them time to work on. Break these hard items down into small bits first. Add water from time to time as the worms like a moist environment, and watering simulates natural rainfall. The Biobin Bulk has been developed for indoor composting of soft organic wastes. Outdoor compost products can be used like shredded leaves, lawn clippings & garden wastes. The Biobin likely won't have the capacity to handle the volumes of slow composting wastes from a garden landscape, and wasn't designed for that purpose.









Proudly Manufactured by Briteland Agricultural Services & Supplies by:

Briteland can be contacted for further information
on the Biobin or on all of their other unique and exciting products by:
Mail or by visiting the Retail Store at
3208 28th Street
Vernon BC V1T 4Z8
Phone: 250-545-3420, Toll Free 1-800-663-5416
Fax: 250-545-4921
Internet: info@briteland.com Web Page: www.briteland.com